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| 09/683,122 | 11/21/2001 | Amy Ruth Reibman | 2000-0639 | 9332 |

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AT&T CORP.
P.O. BOX 4110
MIDDLETOWN, NJ 07748

EXAMINER

LE, VU

| ART UNIT | PAPER NUMBER |
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2613

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,122

Applicant(s)

REIBMAN ET AL.

Examiner

Vu Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-29 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 1-29 are objected to because of the following informalities:

Claim numbering is improper. "c1-c29" should be replaced with numeral 1-29 respectively. Appropriate correction is required.

2. Claims 7, 14, 20 recite the apparatus is a computer-readable medium. The apparatus cannot by itself be a computer readable medium, unless it is written as for example, "The apparatus is a computer-implemented readable medium when executed, performs...". Because a readable medium by itself is not statutory unless it is being implemented by an apparatus to carry out a step(s).

Appropriate correction is required. For the purpose of art rejection, claims 7, 14 and 20 will be interpreted to encompass a readable medium being implemented by a computer.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent; or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English.

4. Claims 1-7, 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Tan, US 6,408,096.

Re claim 1, Tan discloses an apparatus for compressing video (fig. 1) comprising:

an encoder (110) further comprising means for producing a drift-aware bitstream (130,140, col. 5, line 43 – col. 6, line 9, in this segment, Tan discloses a drift-aware bistream as a multiplexed bitstream with a complexity parameter),

and means for prioritizing transport of the drift-aware bitstream (col. 8, lines 23-39), wherein a corresponding decoder (190) can utilize the drift-aware bitstream to manage drift while decoding the compressed video (col. 5, line 57 – col. 6, line 9).

Re claim 2, the apparatus of claim 1 wherein the encoder further comprises means for introducing drift incrementally (col. 5, line 66 – col. 6, line 9, the complexity parameter introduced into the bitstream for graceful degradation at the decoder i.e. introducing drift incrementally).

Re claim 3, the apparatus of claim 1 wherein the encoder further comprises means for measuring the drift potentially being introduced (130, col. 7, line 65 – col. 8, line 12).

Re claim 4, the apparatus of claim 1 wherein the encoder further comprises means for encoding options in the drift-aware bitstream that permit drift while simultaneously controlling the amount of drift (col. 6, lines 34-46).

Re claim 5, the apparatus of claim 1 wherein the encoder further comprises means for reducing or eliminating drift (130, the complexity parameter encoder is the means for reducing or eliminating drift).

Re claim 6, the apparatus of claim 1 wherein the encoder further comprises means for optimizing expected quality for the drift-aware bitstream across receivers (col. 8, lines 7-32).

Re claim 7, the apparatus of claim 1 wherein the apparatus is a computer-readable medium (col. 8, lines 13-22, in this segment, software implementation implies computer-readable medium).

Claim 21 recites "[A]" method of encoding a compressed video stream comprising: receiving an uncompressed video stream; encoding the uncompressed video stream as a drift-aware bitstream, and prioritizing the transport of the drift-aware bitstream[.]" (See analysis/rejection w/r to claim 1, Tan also discloses a method, see "Field of the Invention").

Claim 22 recites "[T]"he method of claim 21 wherein the drift-aware bitstream includes control information for managing drift in the drift-aware bitstream[.]" (See analysis/rejection w/r to claims 2-5).

Claim 23 recites "[T]"he method of claim 22 wherein the control information comprises an error prediction strategy[.]" (See fig. 2, which shows a prediction coding system carrying out the error prediction strategy).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tan, US 6,408,096 as applied to claims 21-22 above and further in view of Arnold et al, "Efficient drift-free signal-to-noise ratio scalability", IEEE Trans. On Circuits and Systems for Video Technology, Vol. 10, Issue 1, pp.70-82, February 2000.

Re claim 24, Tan fails to further disclose whether the control information for managing drift comprises adjustments to quantization.

Arnold et al makes it well known using adjustments to quantization as control information for managing drift. (See p. 71, 2nd col., last paragraph – p. 73, 2nd col. 1st paragraph, in this segment, the control information is varying the quantizer step size).

Therefore, taking the combined teaching of Tan and Arnold et al as a whole, it would have been obvious to modify the method of managing drift as taught in Tan by also including adjustments to quantization as control information as taught in Arnold et al for the benefit of improving signal-to-noise (SNR) performance.

7. **Claims 8-12, 14-20, 25-29 are rejected under 35 U.S.C. 102(a) as being anticipated by Arnold et al, "Efficient drift-free signal-to-noise ratio scalability",**

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IEEE Trans. On Circuits and Systems for Video Technology, Vol. 10, Issue 1, pp.70-82, February 2000.

Re claim 8, Arnold et al discloses an apparatus for encoding compressed video (fig. 2) comprising:

an input for receiving uncompressed video (fig. 2);

a first output for transmitting a base layer of the compressed video ("Base Layer Bitstream");

a second output for transmitting an enhancement layer of the compressed video ("Enhancement Bitstream");

and an encoder capable of receiving video bits from the input, encoding the video in a base layer and an enhancement layer, and sending the base layer to the first output and the enhancement layer to the second output (fig. 2, the entire figure represent the encoder as claimed), and a drift controller connected to the encoder which manages drift introduced into the base layer of the compressed video (p. 71, 2nd col., last paragraph – p. 73, 2nd col. 1st paragraph, in this segment, drift is controlled by varying the quantizer step size).

Re claim 9, the apparatus of claim 8 wherein the drift controller selects an amount of drift by including control information in the compressed video (p. 71, 2nd col., last paragraph – p. 73, 2nd col. 1st paragraph, in this segment, the control information is varying the quantizer step size).

Re claim 10, the apparatus of claim 9 wherein the control information comprises an error prediction strategy (p. 71, 2nd col., last paragraph – p. 73, 2nd col. 1st paragraph,

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in this segment, the control information which is varying quantization step size also depends on the predictive nature of the encoder of fig. 2, see p. 71, 2nd col. 3rd paragraph).

Re claim 11, the apparatus of claim 9 wherein the control information comprises adjustments to quantization (see analysis/rejection w/r to claim 9).

Re claim 12, the apparatus of claim 8 wherein the encoder further comprises: a coarse frame memory that depends only on the base layer; a fine frame memory that depends on the enhancement layer and the base layer, wherein the coarse frame memory and the fine frame memory provide predictions to the drift controller (fig. 2, see "Quantization (fine)" & "Quantization (course)).

Re claim 14, the apparatus of claim 8 wherein the apparatus is a computer-readable medium (fig. 2 is an MPEG-compliant encoder. MPEG protocol implies software implementation capabilities, thus would inherently involve computer or microprocessor-based readable medium).

Re claim 15, Arnold et al discloses an apparatus for decoding a compressed video stream (fig. 14) comprising:

a first error predictor capable of predicting error depending on base layer information in the compressed video stream (fig. 14, see "Base Layer Bitstream" decoding path);

a second error predictor capable of predicting error depending on the base layer information and enhancement layer information in the compressed video stream (fig. 14, see "Enhancement Layer Bitstream" decoding path);

and a drift compensator capable of combining error predictions from the first and second error predictors in accordance with a drift management option included in the compressed video stream (p. 76, 2nd col., last paragraph – p. 78, 1st col., 1st paragraph).

Re claim 16, the apparatus of claim 15 wherein the first and second error predictors comprise a coarse and a fine motion-compensated frame memory respectively (fig. 14, i.e. Q^{-1}_{coarse} and Q^{-1}_{fine}).

Re claim 17, the apparatus of claim 15 wherein the drift management option specifies a combination of error predictions which reduces drift (p. 76, 2nd col., last paragraph – p. 78, 1st col., 1st paragraph).

Re claim 18, the apparatus of claim 15 wherein the drift management option specifies a combination of error predictions which eliminates drift (p. 76, 2nd col., last paragraph – p. 78, 1st col., 1st paragraph).

Re claim 19, the apparatus of claim 15 wherein the drift management option specifies a combination of error predictions which allows drift (p. 76, 2nd col., last paragraph – p. 78, 1st col., 1st paragraph, in this segment, the decoder design is to reduce or eliminate drift, however, there are instances in which drift is unavoidable).

Re claim 20, the apparatus of claim 15 wherein the apparatus is a computer-readable medium (fig. 14 is an MPEG-compliant decoder. MPEG protocol implies software implementation capabilities, thus would inherently involve computer or microprocessor-based readable medium).

Claim 25 recites “[A]” method of decoding a compressed video stream comprising: receiving a first error prediction depending on base layer information,

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receiving a second error prediction depending on base layer information and enhancement layer information, and combining the first and second error predictions according to macroblock type information, resulting in a prediction that is applied to the video stream[.]” (See analysis/rejection w/r to claim 15).

Claim 26 recites “[T]he method of claim 25 wherein the first and second error predictions are received from a coarse and a fine motion-compensated frame memory respectively[.]” (See analysis/rejection w/r to claim 16).

Claim 27 recites “[T]he method of claim 25 wherein combining the first and second error predictions reduces drift, in accordance with an option in the macroblock type information[.]” (See analysis/rejection w/r to claim 17, in this segment, the MPEG-compliant decoding disclosed in Arnold et al inherently implies macroblock type prediction information).

Claim 28 recites “[T]he method of claim 25 wherein combining the first and second error predictions eliminates drift, in accordance with an option in the macroblock type information[.]” (See analysis/rejection w/r to claim 18).

Claim 29 recites “[T]he method of claim 25 wherein combining the first and second error predictions allows drift, in accordance with an option in the macroblock type information[.]” (See analysis/rejection w/r to claim 19).

Allowable Subject Matter

8. Claims 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claim 13 recites "[T]he apparatus of claim 8 further comprising a third output for transmitting a second enhancement layer of the compressed video, wherein the encoder and the drift controller do not allow errors from the second enhancement layer to propagate to the base layer[.]" The prior art of record fails to anticipate or render obvious the limitations of a third output for transmitting a second enhancement layer of the compressed video, wherein the encoder and the drift controller do not allow errors from the second enhancement layer to propagate to the base layer in the manner as claimed.

Contact

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Le whose telephone number is 703-308-6613. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 703-305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Vu Le', is written over the printed name.

Vu Le
Primary Examiner

AU 2613

(703) 308-6613

Vu.Le@uspto.gov